

REMARKS/ARGUMENT

Regarding the Claims in General:

Claims 1-18 remain pending. Claims 1-3, 5, 6, 8, and 10 have been amended to better highlight distinguishing features of the invention, to improve the form thereof, and (in the case of claim 10), to correct an error.

These claims now recite more explicitly what was already at least implicit in the claims as previously presented, and have therefore not been narrowed for statutory purposes related to patentability.

Regarding The Allowable Subject Matter

Applicants note with appreciation the allowance of claims.

Regarding the Prior Art Rejections:

In the outstanding Office Action, claims 1-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Ano U.S. Patent 6,815,8368 (Ano), claims 10 and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Manansala U.S. Patent 6,962,282 (Manansala) and claims 10-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Fujisawa Published U. S. Application 2005/0189567 A1 (Fujisawa). Reconsideration and withdrawal of these rejections are respectfully requested in view of the amendments herein.

With all due respect, applicants and their representatives are at a loss to understand the Examiner's thinking as reflected in the prosecution history of the claims. Claim 1 is directed to a method of bonding wire between first and second bonding points with a bonding tool. Basically, the method involves forming a bond at a first bonding point, forming a loop by moving the bonding tool away from and thereafter back toward the first bond, contacting the loop to itself at or near the first bonding point without bonding the wire, thereafter, moving the bonding tool away from the first bond, forming a kink in the wire, then extending a sufficient length of wire to form a wire loop between the first and second bonding points; and finally, forming a second bond at the second

bonding point. One important feature is that the loop is not anchored by a second bond at the first bonding point.

Claim 10 is directed to an article of manufacture formed according to the method of the invention.

In a second Office Action dated March 29, 2005, previous rejections based on other references were withdrawn, and claims 1 and 10, among others, were rejected under 35 U.S.C. 102(e) as being anticipated by Ano. However, in Ano, a wire is bonded to a first bond point, and a loop is formed behind the first bond by bonding the wire to itself near the first bond point after the first bond is formed. This is clearly stated at Col. 5, lines 30-35 of the patent specification, and illustrated in Fig. 3.

In response to the Office Action of March 29, 2005 (see communication dated July 19, 2005), it was argued that claim 1 does not call for a second bond near the first bonding point, but rather, only that the two ends of the loop be “coupled”. Claim 1 was not significantly amended. Similar arguments were presented relative to claim 10, but this claim was amended to highlight distinctions over Ano.

The Examiner evidently recognized the significance of the distinction noted above, and in the subsequent Office Action dated October 4, 2005, the rejection based on Ano was withdrawn, and a new rejection of claim 1 based on Fujisawa was substituted. *Claim, 10, however, was allowed.*

As discussed in response to the October 4, 2005 Office Action (see communication dated December 23, 2005), Fujisawa suffers from the same defect as Ano: after a first bond is formed, a backward loop is formed in the wire, and the portion of the wire 3c is crushed back onto the initial ball bond 30 and is bonded a second time at the first bond point M1. This is clearly illustrated in Figs. 1A, 3f, and 3g. The relevant description appears in paragraph [0048]. There is no disclosure, teaching or suggestion in Fujisawa for a simple mechanical contact, i.e., without bonding. Nevertheless, to make it crystal clear that claim 1 excludes bonding of the loop a second time at the first bond point, claim 1 was amended to recite:

forming a first bond at the first bonding point with the bonding tool;

moving the bonding tool away from the first bond by a first distance;

moving the bonding tool towards the first bonding point and coupling the wire to the first bond without bonding the wire thereto;

Now, much to the surprise of applicants and their representatives, the rejection of claim 1 has been withdrawn once again, and the rejection based on Ano has been reinstated, despite the fact that successive amendments have distanced this claim further and further from the idea of bonding the loop to itself at the first bonding point.

In addition, the allowance of claim 10 has been withdrawn, and claim 10 is rejected under 35 U.S.C. 102 over Ano and Fujisawa, as well as a new reference, Manansala.

Despite all of the indecision and reinstatement of withdrawn rejections, applicants respectfully submit that the Examiner still has not found a single reference in which a wire is bonded at a first point, looped back to the first point and brought into contact with itself, *but not bonded to itself at the first point*, and then, extended again and kinked, then extended further and bonded at a second point. What is worse, the Examiner seems to be ignoring these distinctions entirely, or has failed to appreciate that it has always been the intent of claim 1 that there be only a single bond at or near the first bond point, i.e., that the part of the loop formed after the first bond be in contact with, *but not attached to*, the first bond.

Applicants and their representatives are likewise at a loss to understand how better to highlight for the Examiner that there is only one bond at the first bond point. In an effort to do so, however, claim 1 has now been amended to read as follows:

As amended, claim 1 includes recitation of the following steps:

forming a first bond at the first bonding point with the bonding tool;

moving the bonding tool to a first position spaced from the first bond by a first distance;

moving the bonding tool from the first position towards the first bonding point and *applying a force on the first bond with the wire, but without forming a second bond of the wire thereto . . .* (emphasis added)

This recitation, which is supported in the specification at page 5, line 31 through page 6, line 3, clearly differentiates claim 1 from Ano.

Claim 1 further calls for (in the stated order):

... moving the bonding tool to a second position spaced from the first bond by a second distance; [and]

forming a kink in the wire. . .

To find formation of a kink in Ano, the Examiner must characterize the loop described above as both the claimed neck, and also the kink. The logic of this is questionable, but even if it is accepted that there is a kink in Ana, this kink is not formed after contacting the wire to the first bond without bonding the wire, as required by the recitation quoted above. Claim 1 requires that the steps take place in the recited order. The Examiner seems to have totally ignored the recited sequence of the steps. Claim 1 is patentable over Ano for this reason as well.

As to claim 10, this has been amended to read as follows:

a ball-bonded base portion;

a neck portion integrally formed with a top of the base portion that is constructed of a first extension of the wire from the base portion in a direction toward another wire bond immediately after formation of the base portion; and

a second extension of the wire running from the neck portion substantially transversely to an axis that is substantially normal to a bonding surface of the wire bond at substantially the same height as the top of the base portion in a direction toward the other wire bond.

None of the references anticipates this claim. As previously explained, in Ana, a small loop of the wire is formed by extending the wire from the first bond away from the bond point and then back to the first bond point where it is attached to itself in the region 306, 307 (Fig. 3). The result is a loop formed *behind* the first bond relative to the second bonding point. This not only wastes wire, and results in a weak neck portion which may be damaged when the wire is extended to the second bonding point, but it is contrary to what is called for in claim 10.

In Fujisawa, the neck portion 3a also loops backward, i.e., away from the second bond point. Therefore, there is no "... neck portion ... constructed of a first extension of the wire from the base portion ... toward another wire bond immediately after formation of the base portion. . ."

Although the Examiner asserts that Ano's the wire loop has two sections 306 and 307, one part of which extends toward the second bonding point, careful reading of claim 10 reveals that the neck portion must be constructed of "... a first extension of the wire from the base portion in a direction toward another wire bond immediately after formation of the base portion." In Ano, the part most closely corresponding the first extension, i.e., 306, is in a direction *away from* the second bond point.

As regards Manansala, the relevant part (i.e., Fig. 13) concerns compensating for a non-parallel relationship between a chip surface and a substrate. This, in Manansala, a ball is first formed (Fig. 13), then the wire is stitched onto the ball (Fig. 14). The area of attachment to the first bond point is not constructed of a first extension of the wire from a base portion of the first bond. Instead, the wire is separately stitched directly onto the ball, in what is commonly referred to in the art as "Bond Stitch on Ball" (BSOB). Thus, there is no first extension forming a "neck" portion at all. Likewise, there is no second extension from a neck to the second bond point.

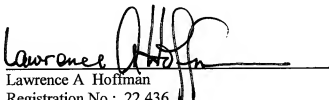
Claims 2-9 are dependent on claim 1, and claims 11-13 are dependent on claim 10. These claims are also allowable for the reasons stated above. In addition, these claims recite features which, in combination with the features of their respective parent claims, are neither taught nor suggested in any of the references.

In view of the foregoing, favorable reconsideration and allowance of this application are respectfully solicited.

Respectfully submitted,

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